detecting electric current value of a driving power source of the high-frequency amplifier section 18b.

(10) As shown in Fig. 11, the above embodiment may be modified such that a power limiter 24 for stopping the high-frequency power which generates excessive plasma entering to the antenna 15 in the probe is provided behind the plasma density information measuring probe 12. Especially when the plasma PM disappears unexpectedly, there is an adverse possibility that the high-frequency power for generating the plasma is directly placed on the antenna 15, and the probe control section 13 is destroyed. In this modification, the power limit 24 prevents the excessive mixed high-frequency power from flowing into the probe control section, thereby preventing the probe control section 13 from being destroyed.

A switch (not shown) such as a relay type coaxial switch and a semiconductor type electronic switch may be used instead of the power limiter 24. The switch may carry out the on-off operation manually. However, in order to prevent the probe control section 13 from being destroyed, it is effective that the switch can detect that the reversely flowing high-frequency exceeds a constant level (e.g., 1.2 times of supplied high-frequency power), and the switch is automatically turned on or off, or plasma light is monitored by an optical sensor, and when the optical sensor detects that the plasma light disappear, the switch is automatically turned on or off.

(11) The above embodiment may be modified such that the measuring probe 12 is inserted for forward and backward movement into the chamber in which the plasma PM is generated, and there is provided prove moving means for moving the measuring probe 12 such that the tip end of the measuring probe 12 is pulled backward from the measuring position in the chamber 1 to a position close to the wall surface of the camber 1 when the measuring is not carried out. With this modification, even

plasma generates stains thickly on the surface of the measuring probe 12, the amount of stains is reduced, and the lifetime of the measuring probe 12 is elongated.

More specifically, as shown in Fig. 12, the measuring probe 12 is integrally provided with a movable piece 25, the movable piece 25 is threadedly engaged to a sending screw bar 26, and as a motor 27 rotates and the sending screw bar 26 is rotated, the movable piece 25 is reciprocally moved in the longitudinal direction of the measuring probe 12. When measuring is not carried out, the tip end of the measuring probe 12 is pulled backward to a retreat position in the vicinity of the wall surface of the chamber 1 as shown with a solid line in Fig. 12, and when the measuring is carried out, the motor 27 is controlled such that the tip end of the measuring probe 12 is advanced to a measuring position in the chamber 1 as shown with a dotted line in Fig. 12.

(12) The insulative material 16c between the core wire 16a and the shield wire 16b of the coaxial cable 16 is fluorocarbon resin in the above embodiment. Fig. 13 shows a modification in which an insulative material 16d filling a gap between the core wire 16a and a conductor tube 16e for shield is heat-resistant (insulative) ceramics. In this case, the heat-resistance of the coaxial cable 16 is enhanced.

(13) In a measuring probe 12 of another embodiment shown in Fig. 14, a dielectric tube 14 is covered with a metal film 28 such that only a measuring region is not covered with the metal film 28. That is, a portion of the metal film 28 corresponding to the measuring region is cut out to form a window 28a. The high-frequency power does not enter the metal film 28 and can only enter the window 28a. Therefore, a local state of the measuring area that is not coated with the metal film 28 is strongly reflected to the measuring result and as a result, the spatial resolution can be enhanced.

(14) In a measuring probe 12 of another embodiment shown in Fig. 15, the

loop antenna 15 is replaced by a wire antenna 15a, and the wire antenna 15a is extended closely along the inner surface of the dielectric tube 14. With this structure, there are merits that the high-frequency power is efficiently supplied, and the required high-frequency power can be reduced, and the measuring precision is enhanced. Even with the loop antenna 15, if it is extended closely along the inner surface of the dielectric tube 14, the high-frequency power is likewise supplied efficiently.

The present invention may be embodied in other specific forms without departing from the spirit or essential attributes thereof and, accordingly, reference should be made to the appended claims, rather than to the foregoing specification, as indicating the scope of the invention.